

# LAFAYETTE

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# COLLEGE

*Electric Formula SAE 2019-2020*

Easton, Pennsylvania 18042-1775

## **FSAE Electric Formula Car Minutes – 3:10, AEC 429, November 18, 2019**

In Attendance:

Cat, Jordyn, Austin, Feng, Tony, Alicia, Clement, Leah, Simon, Dwayne, Phillip, Maureen, Micheal, Gabe, Jon, Luke, Tim, Jack, Noah, Nick, Luc, Zach, Carl, Monserrat, Prof Nad, Pro Helm, Pro Sally

Call to order  
Scribe for the day

Jordyn & Cat  
Maureen

Subsystem Updates

### **Scada**

- Finished hardcoded dash display UI
- New Ideas for driver display
  - Give instructions for what the driver needs to do
  - How to operate car, show motor is overheated, why drive mode was exited
  - Dan has ideas
  - TSI overcurrent, driver knows when that takes place
- LED
- Dwayne started working on module
- Need router to sit on top of enclosure to get wifi signal
- Talk to carman
- Discuss new scada system/ demonstrate
- Plan for this week connect drivers display

### **GLV**

- Has test plan
- Board almost finished, waiting for some parts
- Continue testing relays, then hook up to dyno room and see if everything works in there
- Go back and check currents and see if there are voltage drops
  - Figure out where the voltage drop is happening
- Have board soldered by end of this week
- Board is compatible with connectors and cables

- Output of 10 amps from GLV with shore power, need to fix voltage drop problem

Keeping DC2DC, will it handle the fan and the pump?

Mounting shaft in dyno room this afternoon

Need to buy new adapter for tubing

Using the 12 volt pump

## **TSI**

- Working on solving issue of recharge circuitry
- Working on throttle connection this week
- Board is compatible with the cabling, goal date for in dyno room by first week in December
- Sketch of cooling system by Phil
  - Main problem is getting adapters to match up with diameters of motor controller, motor, radiator, and pump
  - ¼ inch inner diameter for motor
  - We can setup cooling system in dyno room by the end of this week
  - 10% of electrical power lost is due to heat, heat loss analysis

## **TSV**

- Finished fsm for display, you can press buttons and screens will switch accordingly
- Going to use white and black display
- Fixed I<sup>2</sup>C bugs, researched CAD implementations, program configurations on pacs themselves
- This week plan to get test for canbus up and running with raspberry pis
- Need to test all buses, glad to hear people are doing this
- The display looks good, input configuration to know if it is pack 1 or pack 2
- Numbering of cells to see which one is going wrong
  - Need to label packs when manufactured, so when we open lid we know which cell is the bad one
- Bars are different lengths in packs, worked with Prof Helm to redo bars
  - Rob is going to start cutting those
- One terminal is going to fuse, unsure of how to connect yet
- Plan to create our own cables with battery terminal lug to run cabling to outside of pac enclosure
- Display plate has five buttons and correct dimensions, square representative of pac charger
  - Smaller box is all TSV high-voltage, you cannot have any breach of TSV with GLV, box is well insulated because of this
  - Outer box is GLV, biggest concern is how to not violate the rules right now
- 12 inch width so need to adjust
- Recommend getting rid of now we are charging light and instead show it on the display
  - Don't want a second light on the pac, may only need one light
- Tim continued to update design from revision of design review, have parts in by the end of the week
  - He needs help with parts, has a list of them for anyone who needs work to do

- Check slack if you are working on parts in lab
- Looked into manufacturing and assembling garylite

### **Interconnect**

- Design review showed a lot of issues
  - Higher level image of our new idea
  - Taking the motor controller out of the carman box
  - A lot more space, going to mount mc behind the motor
    - Doesn't need access
  - Worked on getting all parts in the new carman
  - Design review NOV 19
- Need to update diagram based on mc outside of carman

### **Chassis**

- Updated frame based on new SES
- Mount designed for TSAL
- Plan to finish the MechE testing plan, printing part
- Check rules to see if diagonal bracing is acceptable
- Rules are not specific, going to contact rules person about it
  - Review their picture in the rules, the diagonal bar is a structure specified in the rules
- Need frame put together before end of semester
- Parts should be here in 4-5 days, weld them in when they get in (before or after T-giving)
- Taken steps to fix suspension
- Email rules person today
- TSAL hangs down from top roll hoop, highest point on car

### **Drivetrain**

- Ordered sprockets and chain for drivetrain
- Design motor strain relief
  - Work with cabling on strain relief
  - Hole in middle should accommodate for other wires coming from the motor
  - Box that cuts into battery cable terminals?
  - There is a pvc pipe that houses them
- Designed new motor shaft
- Centering cylinder to slot into motor
- Cylinder to center sprocket onto shaft
- Will fit the new motor
  - Cannot make it fit both motors because shaft size is different
  - If we add a ring we will favor the old motor
  - Can make two of these so we have a backup
- In dyno room we are using the same shaft we had on the old motor
  - Took enough off the diameter to insert into new motor
- Plan to weld on those mounts to radiator

## **Suspension**

- Assemble rear-arm
- Steering shaft covered
- Big goal is to find new way to mount to vertical steering shaft because of hole
- Finish up changes to the uprights
- Welding pick up points
- Worked on Rear-suspension and put them in inventor assembly
- Not confident enough to give a hard deadline
- Do not take any measurements from inventor
- Get as much stuff assembled as they possibly can

## **Pedals**

- Dan is manufacturing

## **Management**

- Revised the gantt chart overall for the system
  - Critical paths are carman getting finished, rolling chassis less than a month away
  - Print this out
  - Prototype packs tested, water cool being tested
  - Month of interim so want carman system integration tested
  - steering, suspension, and brakes are all included in rolling chassis
    - Motor mount not included
    - Add other mechanical things to schedule
- This week was our worst progress week yet, not a great week for us
- MechE's are working on items that aren't specifically WBS items, just small parts of the bigger picture
- If I doubled what we have done so far, do we have a working car?
- Technicians will be here over interim that are more than happy to have something to do, need to have things to them before the end of the semester

## **Budget**

- Not much more spent
- Only two orders that went out
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